

ARIZONA SILVER BELT.

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THE MINING FIELD.

A Brief Portrayal of the Mining Industry of Arizona and the Great Southwest.

MINE AND MILL---SHAFT, CHUTE AND TUNNEL.

PROGRESS BEING MADE BY PROSPECTOR AND PROMOTER--THE MINING INDUSTRY THROUGHOUT THE GLOBE COPPER BELT--A WEEKLY RESUME OF TRANSPIRING EVENTS TERSELY TOLD.

THE SPENAZUMA.

B. B. Clark of Meriden, Conn., who has been spending some time at the Spenazuma company's mines, in the Clark and Black Rock districts, arrived last night's train and will remain in Globe several days. Mr. Clark is a stockholder in the Spenazuma company, and he gives a very encouraging report of the company's mines. On their gold mines in the Clark district, they have a force of thirty men doing development work. In the Happy Jack and Mocking Bird, two of their principal mines, the ore assays \$45 and \$25 per ton respectively. What promises to be an important discovery was recently made on unlocated ground. The vein, which is 22 inches wide on the surface, has been traced for a mile and where prospected shows good values in gold. Great possibilities are also contained in an immense porphyry dyke sealed with quartz stringers, the dyke mass carrying gold, as shown by assays giving returns of from \$2 to \$65, the latter from a sample taken from the 82 foot shaft. While Mr. Clark was at the mines a 1400-pound sample was taken from this dyke and sent to El Paso to be treated, which should be a fair test of the average gold value in the dyke. The company is also working a small force on their claims in the Black Rock district and recently made an important strike of copper. Prof. George A. Treadwell recently examined these properties for the company, and made a highly favorable report in which he stated that sufficient ore has already been developed to warrant the erection of a mill.

LOCAL MINING NOTES.

Burt H. Collins, who is developing the Cole-Goodwin property has gone to Stanton, Yavapai county, where he is interested with his father extensively in gold mines.

F. O. Mackey shipped a carload of copper ore to El Paso last week. An assay of the ore made at the Globe Sampling Works showed a value of 17 per cent copper.

Finletter & Harvey shipped a carload of 23 per cent copper ore from their Copper Hill property, near Oak Springs, to the El Paso Smelting Works last week.

N. S. Berry, who was expected here last week on business connected with the Copper Hill mines, was unexpectedly called to Mexico. His visit to Globe will in consequence be deferred several weeks.

Superintendent E. H. Cook of the United Globe mines, returned from El Paso on Monday night, and having concluded satisfactory arrangements for the shipment of ore to the El Paso Smelting Works, the first lot of three carloads went out over the G. V. G. & N. railroad yesterday. Daily shipments will be made.

Superintendent George Calder of the Pinto Creek Mining & Smelting company, went out yesterday to the mines, with men and supplies, to resume active development work. In addition to the 300-foot tunnel to be driven on the Yo Tambien mine, the contract for which was let to James and Ed Whelan, a force of six or eight men will be put to work under Supt. Calder's immediate supervision.

John T. Donnellan returned to Globe a few days since from a visit of six weeks in Colorado and Utah. Mr. Donnellan will leave tomorrow morning for Rye to start development work on a group of silver and copper claims in which he is a partner with W. B. Cullum and H. W. Nash, whose interests he has bought. These claims are the old Boyd & O'Dougherty property which were located twenty-five years ago, and produced considerable silver. Mr. Donnellan will open new works and prospect the claims thoroughly.

H. A. Heberlein, who holds the position of assistant superintendent of the Ray copper mines, came over from Kelvin last Saturday and remained until Monday. Mr. Heberlein spoke very encouragingly of the progress made in the development of the Ray properties and the extensive surface improvements. The concentrating mill at Kelvin has been completed, also the railroad between the mines and mill, and the company will soon be prepared to start up their reduction works.

P. J. Cole was in yesterday from the Cole & Goodwin mines on the north fork of Mineral Creek, which are bonded to Burt H. Collins. The preliminary work of grading around the mouth of the shaft and erecting a whim was finished recently and sinking is now under way, with day and night shifts employed. The shaft which was

50 feet deep, and in sulphide ore, will be put down 200 feet and the ledge crossed. This is one of the promising new properties in the country tributary to Globe.

Territorial and General.

The Mining & Scientific Press says that Jno. Andrews, long-time foreman at the Copper Queen, Arizona, will have charge for Ben and Lewis Williams at their new field of operations near Milton, Cal.

The Yuma Sun states that three hundred and seventy-five pounds of giant powder was recently fired at one shot at the Golden Cross mine at Hedges, breaking down ore enough to run a 150-stamp mill for several weeks.

The Arizona Blade says that Mr. Phoeby has let sub-leases on the Silver King, and eight or ten chlorides are at work there now following small stringers of rich ore. Some of these stringers are liable to lead to another large ore body and the plan of giving leasers a chance to follow them is wise.

The Jerome Hustler says: James Patterson completed a deal Thursday whereby he bonded Gold Reef, East Gold Reef and Midgeon mining claims, near the Equator, to Dr. Hendricks of Los Angeles, for \$100,000. The bond is to run three years, but payments are to be made at intervals meantime. A payment of \$5,000 was made down.

Messrs. Denison and Wakefield shipped twenty tons of selected copper ore, this week, from their new copper discovery situated about three miles east of Pinal. The ore was shipped via Mesa. The mine shows improvement with every foot of depth attained and it is now reasonably certain that this property will develop into a good producer. Arizona Blade.

A Cochise, Ariz., special to the Phoenix Republican says: The third shipment of gold and silver bullion of April was made a few weeks ago by the Commonwealth at Pearce. It consisted of bars to the value of \$120,000. Each of the three shipments contained the same amount, making the bullion product of the Commonwealth mine during the month of April \$340,000.

A great strike of 1200 ounce silver ore was made last week on the Wanda mine, Lorena Flat, at a depth of 80 feet, says the Mohave county Mineral Wealth. The rock is full of horn silver and the body is large. The owners of this valuable mine are J. H. Holmes, Jeff Lane, W. C. Carleton and C. Peterson. Work has been continuous on the mine for the last six months.

The new smelter of the Verde Queen Mining company, at Jerome, is nearing completion and Thos. Campbell, who is an officer of the company, will leave on tomorrow morning's train for Colorado to make arrangements for coke shipments. The capacity of that smelter is 40 tons per day and the company has enough ore in sight to keep it running right along and hope soon to necessitate an additional furnace.

At the Crown Point mine, of which Col. A. O. Brodie is superintendent, the shaft is down to a depth of 450 feet and he says the ledge varies in width from three to twelve feet, and is of an excellent grade for milling. The mill is in operation right along and a general air of activity and prosperity pervades the camp. Mr. Ferguson, who inspected the mine, thinks the Crown Point will soon develop into one of the leading properties in Yavapai county.

The public interest in mining is more general now than it has been for years past, and the amount of money which is going into mining enterprises is very large. One indication of this is the number of letters which we are receiving which contain inquiries about different mines and companies and ask for advice as to purchases of stocks or shares in claims and mining ventures of all sorts. Not a day passes without the receipt of such letters, and their number becomes embarrassing. Engineering & Mining Journal.

E. Hilty, who is operating the Alata mine, at Chloride, under lease and bond, has opened up a fine body of quartz on the surface that lays away over anything recently discovered in

that country, says the Mohave County Miner. The ore as it comes from the vein samples over \$20 in gold and 1,400 ounces in silver to the ton. The ore recently cut in the crosscut is of a good shipping value, and with the new ore body will put that property on an excellent basis. Mr. Hilty is an experienced miner and will open the vein in a systematic manner.

J. A. McGowan of California, and W. E. Pomeroy of Mesa, have taken from E. W. Wilbur a two years' lease on all the mining claims at Goldfields this county, formerly belonging to the Goldfields Mining Co. The lease also includes the old Bull Dog ten-stamp mill, and all mining tools and machinery connected therewith. The lease runs for two years from the first day of this month and includes an option to purchase the entire property, at any time during the life of the lease, for \$5,000. The rent named in the lease is \$125 per month, payable monthly. Arizona Blade.

The Gilbert correspondent of the Prescott Prospect says: Everybody is excited over the new strike in camp about one and a half miles south from the store. Mr. Smith is the lucky man and he is showing some fine samples of ore that is more than extra fine. Some of it is a beautiful gold quartz stained with iron, and pockets where the iron is gone out are lined with gold, in fact filled with it, and by sorting it out carefully it could be made to run half gold. His wife has about two ounces in a bottle that she dug out with her scissors. He has about eighteen inches of a vein at a depth of eighteen feet, six inches of which is this kind of ore.

Work on the mines in Jerome's new gold fields, in the Mineral Point district, has been somewhat retarded during the past two weeks on account of the heavy snow and rain storms prevailing in that neighborhood. The work that has been done, however, has demonstrated the fact that there are other rich deposits of gold in that district than that discovered in the Clune-Wheeler group. On what is known as the Scott group, located south of the railway track, a wonderful rich gold strike has been made. It is said, that the original strike in the district, this group is owned by Liveryman Scott and partners, of Jerome, says the News. Preparations are being made by a number of men who have an abundance of capital, to thoroughly explore several groups in the district and to do so at once. There never has been a gold district yet discovered that had a better surface showing than the Mineral Point.

The one perpendicular shaft in the Calumet runs down a distance of three-quarters of a mile. The sinking of this shaft was the greatest piece of modern engineering known, says the Western Mining World. The management figured that if the copper vein dipped at an angle of 43 degrees from the surface and kept on for a great distance down, it would certainly be caught by running straight down from the surface if a shaft were sunk a distance from the others. This was done and after three years of sinking and encountering nothing but earth, the copper was struck. The miners working from a drift in the perpendicular shaft and those working from the other direction came together one day, and the picks struck within an inch of the surveyors' underground estimate. Now a man can go down the shaft at the Calumet hotel, run down half a mile in a perpendicular shaft, cross over in a drift, and come up on surface two miles from where he started on the top of the ground--the most novel underground promenade in America.

The results of the higher price of copper during 1899 are shown in the report of the Rio Tinto company--the largest European producer for that year. With a very moderate increase in production so large a gain in profits was made that the company was able to pay 80 per cent dividends on its common stock, against 40 per cent in 1898. As one-half the capital is in preferred stock, which receives 5 per cent only, the average return on the entire amount--which is £3,250,000--was 42 per cent in 1899 and 22 per cent in 1898. The company continues to exploit its great deposits of pyritic ores successfully, and the yield shows no signs of diminishing, notwithstanding the centuries during which the mine has been operated. The company last year treated about 40 per cent of the ore taken out at the mines, while 60 per cent was sold for its copper and sulphur values, and exported from Spain. The average copper content of the ore taken out last year was 2.72 per cent, a decrease of 0.13 per cent from 1898; but the changes in this respect have been slight for a number of years past.

R. Kondo, superintendent of the Ashio copper mine, situated 120 miles from Tokio, Japan, is making a tour of the world for the purpose of study-

ing its great copper mines. He was in Arizona last week and inspected the works of the United Verde at Jerome, and the Copper Queen at Bisbee. Of the Ashio mine, Mr. Kondo gave the Phoenix Republican an interesting description. The mine has been prospected to a depth of 3,000 feet and the ore bodies at the bottom are constantly widening, though of a trifle lower grade. The ore of the mine averages from 20 to 25 per cent and is refined by the Bessemer process to 98 or 99. A portion of it is then further refined by another process to 99.5 or 99.87 and drawn into wire. The output of the mine is marketed for the most part in England and Germany, the smaller mines in the vicinity supplying the local market. The workings of the mine are mostly on and above the 1,000-foot level, below that being merely prospect shafts. The plant is equipped with all the modern conveniences, has much machinery from both America and Germany, is lighted by electricity and the machinery is nearly all run by electric force, generated from power by a huge waterfall.

"Two or three or four dollar ore would be valueless in a small vein, but when it occurs in a deposit more than 100 feet wide, you can build upon it for years, says the Western Mining World. The Homestake mine, upon ore averaging less than \$4, has not missed a monthly dividend in twenty years. It, with its allied companies, produces about 3,000 tons daily and the reserves are such that the superintendent is fully justified in saying that twenty years' supply is in sight. It is a common mistake to suppose that this low grade ore is only valuable when free milling, for the lowest ore worked at a profit in the United States is not free milling at all, but produces an ore that must be stamped, concentrated and then smelted. Ore from the Atlantic mine has always yielded a value of less than \$2 per ton, yet it is mined, transported quite a distance, stamped, concentrated and smelted for about \$1.10 a ton, and has been worked at a profit even when copper was lowest." The above statement is quoted from remarks made by a noted metallurgist, Dr. Frank Carpenter, who has been traveling in Colorado and Utah studying the low grade ores of those sections. Dr. Carpenter says the high grade ores can take care of themselves--that it is the low grade that demands attention. What Dr. Carpenter says of Colorado or Utah may apply to any mining state.

The Copper County Evening News of Michigan, publishes an entertaining interview with Mr. B. F. Horn, chief mining engineer of the Copuamata mines of Chile, who is inspecting copper mines and equipment in the United States. He said: "Mining is carried on in that country on an entirely different scale from what it is here. In the first place, there is very little metallic copper there and it is comparatively all copper ore. The ore is exceptionally rich, and when I tell you that nothing but ore which bears fully 10 per cent copper is mined it may cause many of your mining men to doubt my word, but it is a fact. It would not pay us to mine anything that ran less than that percentage because of the excessive high cost of running a mine there. It takes millions to open a copper mine in Chile and more millions to get on a paying basis. The greatest drawback is in the matter of generating power with which to run our machinery. There isn't any wood that could be used, and we have to import coal all the way from Australia at an enormous cost. Another big item is the lack of water. The mining country is almost a desert, and water has to be brought no less than 330 kilometers away from the frontier of Bolivia. This pipe-line to the mines cost over a million dollars alone. When you see that this is but one of the difficulties connected with copper mining in Chile you can readily understand why we have to get out a pretty high grade ore to make it pay. Our ore is mostly of a chloride and sulphurate composition. There is one immense mountain of this ore where most of our mines are located and where the resources for future mining are practically unbounded. You know these copper mines of Chile have been worked from time immemorial. They lay idle for some 250 years before they were taken hold of the last time, but there was plenty of evidence of their having been worked extensively by the Indians, long before the white man ever set foot in South America, and then the Spaniards came along and worked them extensively for some time, the copper being used to supply the demands of the interior people. The principal trouble with the mines of Chile is the lack of sufficient capital to work them. The peons, a mixture of Spanish and Indian blood, do all the work, that is the manual work, while foreigners, principally American and German, are interested financially. The peons work on contract, and considering the fact that most of them are densely ignorant, they make good workmen."

CONGRESS MINE.

One of the Great Gold Producing Mines of Arizona Territory.

A MINE THAT IS SUPERBLY MANAGED.

THE PRESCOTT PROSPECT'S DESCRIPTION OF THE MINE AND REDUCTION PLANT--ITS DEEP SHAFTS AND MILES OF UNDERGROUND WORKINGS--EQUIPPED WITH THE FINEST MACHINERY.

The Congress mine was located more than twenty years ago and the discoverer is still a familiar figure about the camp where he narrates with calculating deliberation "the day that I discovered the Congress." But the character that stands out in bold relief in connection with the early and successful history of the Congress mine is Mr. Joe Reynolds, familiarly known as "Diamond Joe." Although the conditions were most inopportune; no railroads; freight, supplies and all things proportionately expensive; when the ore cost \$17 per ton for transportation, the mine paid. Diamond Joe did not live to see the railroad completed to Congress. He died in 1891 and with his death one of the greatest hearts ceased to beat that pushed civilization across the continent. The Congress Gold Mining Co. of which Mr. E. B. Gage is president, purchased the property of the Reynolds estate shortly after the death of Mr. Reynolds. Mr. Gage is well known as one of the most successful mining operators in early Tombstone days as well as his successful career with the Congress mine. To Mr. Frank Murphy is also due much of the success of the Congress mine in its early history. The celebrated Congress mine is composed of a group of about thirty claims, although three claims, the Congress, the Niagara and a cross claim called the Why Not, afford the working. The Congress vein is a peculiar formation, characterized by authority as being a "dyke of green stone trap." The ore is found throughout this entire dyke, or vice versa, the dyke matter is found throughout the entire ledge. The ore in its most extensive form is lodged upon or near the foot wall. The width of this vein cannot be definitely determined, as the hanging wall is not found as a rule, although the drift is usually from twelve to fifteen feet high. The vein, which has a dip of about 22 degrees, is said to be about fifteen feet wide. There is no free gold to speak of in the Congress ore. The ore is white quartz, carrying a great deal of iron pyrites, and singularly free from any other sulphide except iron and sulphur. There has been an immense amount of work done upon the Congress ledge. The vein has been followed in sinking the shaft till the present great depth has been attained, and in each instance the ledge and ore improves with depth. Shaft No. 1, nearest the mill, which has been sunk to a very considerable depth is 300 feet east of No. 2 shaft. This shaft has been sunk to a depth of 2,700 feet and is the deepest shaft in the territory. No. 3 is across the mountain, over a thousand feet from No. 2. This shaft is at present at the depth of 1,900 feet, being rapidly sunk with three shifts daily. The work in the mines is something superb. The shafts being of an incline of about 22 degrees are so arranged that a person may descend on foot by means of a carefully arranged walk or upon a double-track tramway, both of which are equally and perfectly safe. There can hardly be as much danger in passing to and from the deepest workings in the Congress mine than accompanies the majority of the western railroad systems. It is doubtful if there is a more perfect shaft in the entire southwest than shaft No. 3 on the Congress ledge. There is a double heavy track of railroad rails, electric lights and every improvement. This shaft is being sunk to meet one of the lowest levels. One of the superb feats of engineering was exhibited in the driving of the 1,200-foot tunnel through the mountain to connect the new workings on the north side with the mill and cyaniding plant. Two crews of men were put to work on both sides of the mountain and connected with mathematical accuracy in the center of the mountain. A tramway runs through this tunnel and conveys the ore from No. 3 as well as the ore from the shaft that is now being sunk upon the Niagara. It would be difficult to find more perfect and extensive machinery in many a long day's travel than that used for reducing the ore and handling the tailings. The 40-stamp mill continually drops its 550-pound stamps at the rate of 90

times per minute, or 1 1/2 times per second, reducing more than 100 tons daily. This being a concentrating proposition--no plates are used--the pulp is conveyed immediately to 20 fine vanner concentrating tables in as near equal quantities as possible, and the concentrates are drained of water and at once loaded without undergoing the drying process and shipped to El Paso, Texas. The cyanide process is the most interesting feature in the mechanical department of the works. Upon entering the immense building enclosing this plant one is reminded of the enclosed racetrack that is one of the indispensable features of the modern gymnasium. It is around this circular track, of about ten feet in width, that the tailings are carried in their course of final treatment in reduction. There is a mountain of tailings to the extent of at least 100,000 tons, or enough to keep the cyanide plant busily operating for two years. The tailings run \$6 to \$7 per ton. They are being continually worked over by plows and other machinery for the purpose of exposing them to the air or sun to thoroughly dry. After this drying process the tailings are run through a pulverizer and reduced to the finest possible condition and afterwards elevated to a storage bin. From this point the tailings are carried to an automatic feeder of the roasting furnace, which is so heated that the pulp becomes heated by degrees as it is slowly carried through the furnace by an agitator that is not unlike the result of a dozen-shield cultivator, which continually "stirs things up." The furnace is heated by crude oil and thoroughly desulphurizes the tailings, which are gradually carried away for a considerable distance in process of cooking. There are seven leaching tanks 26 feet in diameter, and four solution tanks 15 feet in diameter and 10 feet deep, where the tailings are finally carried and the gold dissolved and lastly collected upon zinc shavings. The machinery is all upon the most extensive scale. Air compressors run the drills as well as perform other functions. At the 1,700 foot level an air compressor runs the hoist from the lowest workings. One of the magnificent pieces of machinery is the 200-horse power hoist. Boilers having 50 to 150 horse power are placed at intervals over the entire workings. The mine is supplied with water pumped a mile distant. There are about 350 men employed in the Congress mine in all of its various departments. The success of the Congress gold mine is due largely to the management of Superintendent W. T. Stanton. To speak exhaustively of this gigantic enterprise with its extensive development work, its superb timbering and its seemingly inexhaustible resources in mineral wealth is a work that comprises a large portion of Arizona's mining history. Five millions have already been produced and no one can tell what the future years will do, doubtless many times in excess of this. The ore is blocked out far in excess of the stamp mill's capacity and prospecting is continually and systematically carried on in the mine. It is one of the mines in a million that far exceeded even the most sanguine expectation and whose example inspires countless prospectors to follow some vain hope far over the barren hills of disappointment.

The Jerome News says the Copper Chief people are at work blocking out ore, and as soon as Superintendent Hendy returns from the east the force will be increased. It is authoritatively reported that there is now \$2,000,000 worth of ore in sight in this group.

A fine body of ore was recently discovered in the Mohawk mine. This property belongs to the Lewisohn Brothers, who also own the Rosemont group. The Mohawk is in the center of the Helvetic group of mines, and the recent strike adds value to the surrounding claims. As the Lewisohn Brothers have several other very valuable copper claims on the Helvetic side of the Santa Rita range the showing being made by the Mohawk is thought by many to make a certainty of the oft-contemplated location of a smelter by the brothers at or near Helvetic--Citizen.